

In The Claims

Applicant submits below a complete listing of the current claims, with any insertions indicated by underlining and any deletions indicated by strikeouts and/or double bracketing.

Listing of the Claims

1. (Currently amended) A terminal for generating an electromagnetic field adapted to cooperating with at least one transponder when the ~~latter enters~~ at least one transponder is within said electromagnetic field and including an oscillating circuit adapted to receiving a high frequency A.C. excitation voltage, including:

means for maintaining a constant phase relationship between a ~~regulating the signal phase~~ in the oscillating circuit ~~with respect to~~ and a reference signal value;

means for determining an instantaneous information relative to ~~the~~ an instantaneous magnetic coupling between the transponder and the terminal; and

means for adapting a power of the electromagnetic field ~~power~~ according to at least said instantaneous information.

2. (Currently amended) The terminal of claim 1, including means for measuring a first quantity which is a function of ~~the~~ an instantaneous voltage across a capacitive element of said oscillating circuit and a second quantity which is a function of ~~the~~ an instantaneous current in said oscillating circuit.

3. (Currently amended) The terminal of claim 1 ~~2~~, including means for determining and storing characteristic information relative to ~~the~~ a magnetic coupling between the transponder and the terminal in several determined configurations of ~~the~~ a distance separating the transponder from the terminal, and for taking account said characteristic information in the ~~field power~~ adaptation ~~according to the instantaneous information~~ of the electromagnetic field power.

4. (Currently amended) The terminal of claim 3, wherein said characteristic information includes, among others:

~~the~~ a voltage across the capacitive element when no transponder is present in the electromagnetic field of the terminal;


~~the~~ a voltage across the capacitive element when a transponder is in a relation of maximum closeness with the terminal;

~~the~~ a current in the oscillating circuit when no transponder is present in the field of the terminal; and

~~the~~ a current in the oscillating circuit when a transponder is in a relation of maximum closeness with the terminal.

5. (Currently amended) The terminal of claim ~~[[4]]~~ 3, wherein said instantaneous information is deduced from ~~the instantaneous measurement~~ respective values of said two quantities and of ~~the~~ respective values of said characteristic information.

6. (Original) The terminal of claim 3, wherein at least one characteristic information is automatically determined by the terminal in a learning phase.

 7. (Currently amended) The terminal of ~~any of~~ claim 1, wherein the means for adapting the power of the electromagnetic field ~~include~~ includes means controllable to modify the A.C. excitation voltage of the oscillating circuit of the terminal.

8. (Currently amended) The terminal of claim 1, wherein the means for adapting the power of the electromagnetic field include one or ~~several~~ more controllable resistive elements, belonging to the oscillating circuit of the terminal.

9. (Currently amended) The terminal of claim 1, wherein ~~the~~ a response time of the ~~phase regulation~~ means for maintaining is chosen to be large as compared to ~~the~~ a frequency of a possible back-modulation coming from a transponder present in the electromagnetic field of the terminal and to be fast as compared to ~~the~~ a displacement speed of a transponder in this electromagnetic field.

10. (Currently amended) The terminal of claim 1, wherein said oscillating circuit includes an element of variable capacitance, said terminal including means adapted to determining ~~the~~ a value of this capacitance based on a phase measurement on the signal in the oscillating circuit by varying ~~the~~ a voltage across the element of variable capacitance.

11. (Currently amended) A method for controlling ~~the terminal of claim 1~~ a terminal for generating an electromagnetic field adapted to cooperating with at least one transponder when the at least one transponder enters within said electromagnetic field and including an oscillating circuit adapted to receiving a high frequency A.C. excitation voltage, the terminal including means for maintaining a constant phase relationship between a signal in the oscillating circuit and a reference signal, means for determining an instantaneous information relative to an instantaneous magnetic coupling between the transponder and the terminal and means for adapting power of the electromagnetic field according to at least said instantaneous information, the method comprising the steps of:

a) during a learning phase:

determining a first characteristic information associated with ~~the~~ a current in the oscillating circuit when no transponder is present in the field of the terminal;

determining a second characteristic information associated with ~~the~~ a current in the oscillating circuit when a transponder is in a relation of maximum closeness with the terminal;

calculating linear relations of control of the magnetic field power according to said current information and to a predetermined nominal value; and

b) in operation:

determining the instantaneous information ~~associated with~~ relative to the magnetic coupling between a the transponder that has entered the terminal's field and said terminal; and adapting the magnetic field power based on said linear relations.

12. (Currently amended) The method of claim 11, wherein said ~~current~~ instantaneous information is a function of the ratio between an instantaneous magnetic coupling coefficient and ~~the~~ a maximum magnetic coupling coefficient obtained when a transponder is in a relation of ~~maxi-mum~~ maximum closeness with the terminal.

13. (New) The method of claim 1, wherein the terminal further includes:
an oscillator to provide an excitation signal to the oscillating circuit, and
wherein the reference signal corresponds to the excitation signal.

14. (New) The method of claim 1, wherein the means for maintaining a constant
phase relationship is operative to maintain a constant relationship between a phase of a current in
the oscillating circuit and a phase of the reference signal.

functional language
15. (New) A terminal for generating an electromagnetic field, the terminal being
(adapted to cooperate with a transponder when the transponder is within the electromagnetic field,))
the terminal comprising:
an oscillating circuit; and
a phase regulating circuit to maintain a constant phase relationship between a current in
the oscillating circuit and a reference signal.

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16. (New) The system of claim 15, wherein the transponder imposes a load on the
oscillating circuit when the transponder is within the electromagnetic field, the imposed load
impacting an impedance of the oscillating circuit and

wherein the phase regulation circuit is operative to compensate for an imaginary part of
the imposed load so that an imaginary part of the impedance of the oscillating circuit is null.

17. (New) The terminal of claim 15, further comprising:
an oscillator to provide an excitation signal to the oscillating circuit,
wherein the reference signal corresponds to the excitation signal.

18. (New) The terminal of claim 15, further comprising:
a control unit to control a substantially linear modification of a power transmitted by the
terminal based on a distance between the transponder and the terminal.

19. (New) The terminal of claim 18, wherein the control unit is operative to control modification of the power transmitted by the terminal by controlling modification of a value of a resistive element in the terminal.

20. (New) The terminal of claim 18, wherein the control unit is operative to control modification of the power transmitted by the terminal by controlling modification of a value of a voltage generated by the terminal.

21. (New) The terminal of claim 18, wherein the control unit is operative to evaluate a distance between the transponder and the terminal according to phase correction information provided by the phase regulating circuit.

22. (New) The terminal of claim 21, wherein the phase correction information includes a voltage across a capacitive element of the oscillating circuit.

a 23. (New) The terminal of claim 15, wherein the phase regulating circuit is operative to detect a phase interval between a current in the oscillating circuit and the reference signal and to modify a capacitance of the oscillating circuit in response to the phase interval.

24. (New) The terminal of claim 15, further comprising:
a current measurement circuit to measure a value of the current in the oscillating circuit and to provide the measured value to the phase regulating circuit.

25. (New) The terminal of claim 15, further comprising:
a storage element to store measurement values corresponding to at least two conditions, the measurement values being acquired during a learning phase of operation of the terminal.

26. (New) The terminal of claim 25, wherein the measurement values include:
a first value of the current in the oscillating circuit corresponding to a first condition wherein the transponder is maximally close to the terminal; and

a second value of the current in the oscillating circuit corresponding to a second condition wherein no transponder is present in the electromagnetic field of the terminal.

27. (New) A method of controlling a power of an electromagnetic field generated by an oscillating circuit of a terminal (adapted to cooperate with a transponder when the transponder is within the electromagnetic field), the method comprising an act of:

(A) maintaining a constant phase relationship between a current in the oscillating circuit and a reference signal.

28. (New) The system of claim 27, wherein the transponder imposes a load on the oscillating circuit when the transponder is within the electromagnetic field, the imposed load impacting an impedance of the oscillating circuit and

wherein the phase regulation circuit is operative to compensate for an imaginary part of the imposed load so that an imaginary part of the impedance of the oscillating circuit is null.

29. (New) The method of claim 27, the terminal further comprising an act of:

(B) providing an excitation signal to the oscillating circuit,
wherein the reference signal corresponds to the excitation signal.

30. (New) The method of claim 27, further comprising an act of:

(B) evaluating a distance between the terminal and a transponder in the electromagnetic field of the terminal; and

(C) modifying the power of the electromagnetic field based on the distance between the terminal and a transponder.

31. (New) The method of claim 30, wherein the act (C) includes modifying a value of a resistive element of the terminal.

32. (New) The method of claim 30, wherein the act (C) includes modifying a value of a voltage generated by the terminal.

33. (New) The method of claim of claim 30, wherein the act (B) comprises evaluating the distance between the terminal and the transponder according to phase correction obtained during the act (A).

34. (New) The method of claim of claim 27, wherein the act (A) includes acts of:
detecting a phase interval between the current in the oscillating circuit and the reference signal; and
modifying a capacitance of the oscillating circuit based on the phase interval.

35. (New) The method of claim 27, wherein the act (A) includes obtaining phase correction information that includes a voltage across a capacitive element of the oscillating circuit.

36. (New) The method of claim 27, wherein the act (A) includes measuring the current in the oscillating circuit.

37. (New) The method of claim 27, further comprising, during a learning phase of operation of the terminal, acts of:

- (B) measuring values of the current corresponding to at least two conditions; and
- (C) storing the values in a storage element of the terminal.

38. (New) The method of claim 37, wherein the act (B) includes:
measuring the current in the oscillating circuit when the transponder is maximally close to the terminal; and
measuring the current when there is no transponder present in the electromagnetic field of the terminal.